SOV/21-58-11-6/28

AUTHORS:      Sigorskiy, V.P., Sinitskiy, L.A., and Shumkov, Yu.M.

TITLE:        Determining the Switching Moment of a Rectifier in an Electrical Circuit of the n-th Order (Opredeleniye momentov pereklyucheniya vypryamitelya v elektricheskoy skheme n-go poryadka)

ABSTRACT:     A rectifier with linear lumped-parameter characteristics can be substituted by an equivalent circuit with a switch. Then the circuit of the n-th order with one rectifier can be represented by a four-terminal network. The authors derive equations for determining the moments of switching the rectifier under the following conditions: at the input of the four-terminal network the voltage $u(t) = U_M \sin(\omega t + \varphi)$ is applied, and a simple periodic process operates in the circuit. Theorems on the closing and opening of the switch $\underline{/}$Ref. 2$\underline{/}$are used in the derivation of these equations. There are: 1 set of block diagrams and 3 Soviet references.

Card 1/2

SOV/21-58-11-6/28

Determining the Switching Moment of a Rectifier in an Electrical Circuit of the n-th Order

ASSOCIATION:   Institut mashinovedeniya i avtomatiki AN UkrSSR (Institute of Machine Study and Automation of the AS UkrSSR)

PRESENTED:     By Member of the AS UkrSSR, K.K. Khrenov

SUBMITTED:     June 24, 1958

NOTE:          Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration.

Card 2/2

S/194/61/000/006/059/077
D201/D302

AUTHOR:         Shumkov, Yu.M.

TITLE:          Designing an inductance-capacitance loaded rectify-
                ing circuit

PERIODICAL:     Referativnyy zhurnal. Avtomatika i radioelektronika,
                no. 6, 1961, 23, abstract 6 E155 (V sb. Vses. Mezh-
                vuz. konferentsiya po teorii i metodam rascheta nel-
                iney n. elektr. tsepey, no. 4, Tashkent, 1960, 18-
                29)

TEXT:    The general design of a half-wave rectifying circuit with
an ideal rectifier working into a load consisting of R and L in ser-
ies, and of a parallel-connected capacitance C (e.g. capacitor
shunted relay winding) is given.  The first order differential equa-
tion for the conduction interval of the rectifier and the second
order differential equation for its non-conducting interval are sol-
ved by determining the integration constants, initial phase of the

Card 1/2

SINITSKIY, L.A.; SHUMKOV, Yu.M.

Satisfactory approximation of the characteristics of transistor
diodes. Radiotekhnika 15 no.12:35-42 D '60.          (MIRA 14:9)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva
radiotekhniki i elektrosvyazi imeni Popova.
(Transistors)

SHUMKOV, Yu.M.

Designing electric circuits with a rectifier and reactive members.
Avtom.kont. i izm.tekh. no.5:36-45 '61.          (MIRA 14:11)
                        (Electric circuits)

SINITSKIY, L.A. [Synyts'kyi, L.A.] (L'vov); SHUMKOV, Yu.M. (L'vov)

Certain qualitative properties of nonlinear circuits with piece-wise characteristic of the nonlinear element. Avtomatyka no.5:61-69 '61.

(Automatic control)

(MIRA 14:12)

33773
S/103/62/023/001/014/014
D201/D304

9.2560 (1040,1139,1161)

AUTHORS:     Sinitskiy, L.A., and Shumkov, Yu.M. (L'vov)

TITLE:       Dynamic properties of synchronous detectors

PERIODICAL:  Avtomatika i telemekhanika, v. 23, no. 1, 1962,
             128 - 130

TEXT:   The authors briefly analyze dynamic processes in synchronous
detector which find more and more application owing to the intro-
duction of switching transistors. It is shown that a synchronous
detector in an automatic control system, in which information is
transmitted by means of an immodulated carrier may be replaced by
a first order linear element. In contrast to a phase detector of
the differential type, such an equivalent circuit remains linear
for all amplitudes of the input signal and makes the analysis quite
simple. The obtained characteristics of the synchronous detector
were used in analyzing a phase detector in an autocompensating cir-
cuit and the experimental results showed good agreement with the
theory. There are 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc

Card 1/2

VERKHOVTSEV, V.S.; PETRUSHKO, I.V.; RAKOV, M.A.; SINITSKIY, L.A.;
SHUMKOV, Yu.M.

Measurement converters with galvanically separated input and
output. Avtom. i prib. no.4:78-81 O-D '63.        (MIRA 16:12)

1. Institut mashinovedeniya i avtomatiki AN UkrSSR.

S/3054/63/000/000/0330/0342

ACCESSION NR:   AT4008773

AUTHORS:   Vorobkevich, V. Yu.; Danilyuk, I. S.; Sinitskiy, L. A.;
Rakov, M. A.; Shumkov, Yu. M.

TITLE:   Pulse-width modulated phase detector

SOURCE:   Pribory* promy*shlennogo kontrolya i sredstva avtomatiki.
Doklady* i soobshcheniya. Kiev, 1963, 330-342

TOPIC TAGS:  phase detector, pulse width modulation, transistorized
phase detector, second harmonic detector, demodulator, transistor-
ized detector, pulse width modulated detector

ABSTRACT:  The operating principles and properties of a second-har-
monic detector using transistors operating in the switching mode are
analyzed.  The operation is based on double conversion of the mea-
sured signal.  The second-harmonic signal is first mixed with a fun-
damental-frequency reference voltage.  The resultant difference in

Card  1/2

ACCESSION NR:   AT4008773

in the durations of the positive and negative half cycles of the com-
bined signal is a function of both the ratio of the amplitudes of
the first and second harmonics and of the phase shift between them.
This makes it possible to use as the second conversion stage a cir-
cuit similar to an ordinary phase detector with switching transis-
tors and to obtain both proportionality of the conversion and power
amplification of the measured signal.  The performance of the cir-
cuit is analyzed for different harmonic ratios as a function of the
circuit parameters.  The detector was used as a demodulator in a
stabilized dc amplifier developed at the Institut mashinovedeniya i
avtomatiki AN UkrSSR (Institute of the Science of Machines and Auto-
mation, AN UkrSSR).  Orig. art. has: 8 figures and 19 formulas.

ASSOCIATION:   Institut mashinovedeniya i avtomatiki AN UkrSSR (Insti-
tute of the Science of Machines and Automation, AN UkrSSR)

SUBMITTED:   00                  DATE ACQ:  25Jan64              ENCL:  02

SUB CODE:   SD                   NO REF SOV:  000                OTHER:  000

Card  2/2

SINITSKIY, L. A.; SHUMKOV, Yu. M. (L'vov)

"Uber die Eindeutigkeit eines periodischen Prozesses in nichtlinearen Wechsel-stromkreisen."

report submitted for 3rd Conf on Nonlinear Oscillations, E. Berlin, 25-30 May 64.

L 19450-65    EWT(i)/EWA(h)    Peb    SSD/AFWL/AFETR/RAEM(a)/ESD(c)/ESD(gs)

ACCESSION NR: AP4049191                    S/0102/64/000/005/0064/0068

AUTHOR: Vasy*l'yev, Ye. D. (Vasil'yev, Ye. D.) (L'viv); Sy*ny*ts'ky*y, L. A. (Sinitskiy, L. A.) (L'viv); Shumkov, Yu. M. (L'viv)

TITLE: Analysis of a synchronous phase detector

SOURCE: Avtomaty*ka, no. 5, 1964, 64-68

TOPIC TAGS: phase detector, phase detection, radio signal detection

ABSTRACT: The effect of the carrier shape upon the dynamic characteristics of a half-wave synchronous detector is theoretically considered. It is demonstrated that, with an input AM signal having an arbitrary periodic shape of the carrier, the detector's dynamic characteristics depend only on the average value of the carrier $f(t)$ over the period $T$ and over the time of current flowing in the key. With no constant component in the function $f(t)$, the carrier shape has no effect on the output-voltage phase shift but affects only its amplitude. In analyzing systems

Card 1/2

L 19450-65
ACCESSION NR: AP4049191

where the signal is transmitted by the carrier, the synchronous detector can be
represented by a linear inertial element of the first order. Orig. art. has:
1 figure and 14 formulas.

ASSOCIATION: none

SUBMITTED: 10Oct63                                    ENCL: 00

SUB CODE: EC              NO REF SOV: 006             OTHER: 001

Card 2/2

ACCESSION NR: AP4015897                     Z/0039/64/025/001/0021/0024

AUTHOR: Vorobkevic, V. Ju. (Vorobkevich, V. Yu.); Daniljuk (Danilyuk), I. S.;
Rakov, M. A.; Sinickij (Sinitskiy), L. A.; Sumkov, Ju. M. (Shumkov, Yu. M)

TITLE: A phase demodulator of the second harmonic, with width modulation

SOURCE: Slaboproudy obzor, v. 25, no. 1, 1964, 21-24

TOPIC TAGS: phase demodulator, modulation, width modulation, second harmonic,
phase detector

ABSTRACT:  A new phase demodulator of the second harmonic, with width modulation,
is described, and its response (transfer coefficient, zero point stability,
dynamic characteristics) is analyzed theoretically and confirmed experimentally.
Designed with semiconductor triodes, the phase demodulator needs only a small
signal power with sufficient zero stability and yields a high power gain.  It
was used in a measuring amplifier for constant current of high stability,
described by Blazhkevich, et al . in Trudy* konferentsii NTO Priboroprom, K 962.
Orig. art. has 17 formulas and 7 figures.
Association:  Ustav teorie stroju a automatizace Akademie ved Ukrajinske, SSR, Lvov
              (Institute of the Theory of Machines and Automation, AN UkrSSR)

Card 1/2                 Submitted:  23 Apr 63

VASIL'YEV, Ye.D.; VERKHOVTSEV, V.S.; VOROBKEVICH, V.Yu.; [...]
    PETRUSHKO, I.V.; PILIPENKO, N.S.; RAKOV, M.A.; [...]
    R.V.; SINITSKIY, L.A., kand. tekhn. nauk; SHKOL'NYY, V.A.;
    SHUMKOV , Yu.M.; YEVSEYENKO-MISYURENKO, I.V., red.

[Direct current measuring converters] Izmeritel'nye preobra-
zovateli postoiannogo toka.  Kiev, Naukova dumka, 1965. 373 p.
                                        (MIRA 18:6)
1. Akademiya nauk URSR, Kiev. Fizyko-mekhanichnyi instytut.
2. Fiziko-mekhanicheskiy institut AN Ukr.SSR, g.L'vov (for
all except Yevseyenko-Misyurenko).

L 55096-65    EWT(1)/EWA(h)    Peb
ACCESSION NR:   AP5014509                          UR/0141/65/008/002/0372/0379

AUTHOR:  Rakov, M. A.; Shumkov, Yu. M.

TITLE:  Multiple modes in a frequency divider with two nonlinear elements

SOURCE:  IVUZ. Radiofizika, v. 8, no. 2, 1965, 372-379

TOPIC TAGS:  frequency division, magnetic frequency divider

ABSTRACT:  The investigated magnetic frequency divider is shown in Fig. 1 of the
Enclosure.  Its operation as a frequency divider with a ratio 1:2 was described by
the authors earlier (Nonlinear Vibration Problems v. 5, Warsaw, 1964).  In the pre-
sent article equations are derived for the variation of the induction in the core
and for the instantaneous value of the voltage across the capacitance, and a system
of transcendental equations is derived for the determination of the switching angles and
capacitor voltages  in the case of higher division ratios.  The derivation is based
on the assumption that the magnetic material has a rectangular magnetization curve
with no hysteresis and that the rectifier has an ideal characteristic.  The deriva-
tion makes use of the continuity of the variation of the induction in the coil, the
periodicity of the process, and the assumption that when the rectifier is noncon-

Card 1/3

L 55096-65
ACCESSION NR:   AP5014509

ducting all the voltage is across the capacitor.  The analysis is carried out by making the operating conditions of the circuit elements continuous as they go through different parts of the operating cycle  and using the dynamic demagnetization curve of the material.  In view of the complexity of the rigorous equation, an approximate method, based on the use of the results for a 1:2 ratio, is described. Experimental results of an actual frequency divider are reported, confirming the calculations.  A feature of the equipment is the relatively wide range of stable division and the ease of transition from one mode to another. Orig. art. has:  4 figures and 20 formulas.                       [02]

ASSOCIATION:  Fiziko-mekhanicheskiy institut  AN UkrSSR (Physicomechanical Institute AN UkrSSR)

SUBMITTED:  04May64                  ENCL:   01                  SUB CODE:     EC

NO REF SOV:  001                     OTHER:  001                 ATD PRESS:  4024
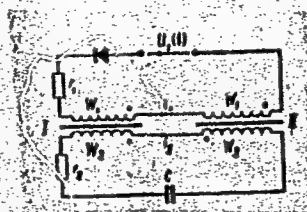
Card 2/3

L 55096-65

Fig. 1. Magnetic frequency divider

Card 3/3

SINOTSKIY, L.A.; SHUMKOV, Yu.M.

Analysis of the operation of magnetic amplifiers with self-saturation and RC load. Elektrichestvo no.11:79-83  N '68.
(MIRA 18:11)

1. Fiziko-mekhanicheskiy institut AN UkrSSR.

RAKON, M.A., kand. tekhn. nauk (L'vov); SHUMKOV, Yu.M., kand. tekhn.
nauk (L'vov)

Analysis of a magnetic frequency divider with a rectifiers in the
excitation circuit. Elektrichestvo no.12:70-74 D '64.
(MIRA 18:12)

ACC NR: AP6027355                    SOURCE CODE: UR/0102/66/000/002/0076/0081

AUTHOR: Rakov, M. A. (L'vov); Synyts'kyy, L. A.--Sinitskiy, L. A. (L'vov);    71
Shumkov, Yu. M. (L'vov)                                                      B

ORG: none

TITLE: Operation of a synchronous detector in multistable elements of automatic
systems

SOURCE: Avtomatyka, no. 2, 1966, 76-81

TOPIC TAGS: automatic control system, detection equipment, semiconductor device,
harmonic analysis

ABSTRACT:    The article deals with the properties of a synchronous detector of
the semiconductor triode type, which are of interest in connection with the
problem of constructing automatic-system elements with many stable states.
The performance of this detector in the presence of a square shaped input signal
is examined for the case of higher harmonics and subharmonics and various types
of generators.  The degree of the suppression of undesirable harmonics, leading
to the possibility of misleading operation of the element, is considered.  Simple
working formulas, which proved to be in satisfactory agreement with the experi-
mental findings on the development of an element with 10 stable states, are
presented.  Orig. art. has:  2 figures and 12 formulas.  [JPRS:  36,517]

SUB CODE:  09  /  SUBM DATE:  18Mar65  /  ORIG REF:  002  /  OTH REF:  001

Card 1/1

ACC NR: AT7004330          SOURCE CODE: UR/0000/66/000/000/0127/0131

AUTHOR: Pavlyuk, E. I. (L'vov); Rakov, M. A. (L'vov); Shumkov, Yu. M. (L'vov)

ORG: none

TITLE: One physical interpretation of the Riemann function

SOURCE: AN UkrSSR. Metody i sredstva preobrazovaniya informatsii (Methods and means of information conversion). Kiev, Naukova dumka, 1966, 127-131

TOPIC TAGS: Riemann function, mathematical physics, riemann space, riemannian geometry, function analysis

ABSTRACT: As the Riemann function is continuous at any irrational point and discontinuous at any rational point, this function has been treated as a mathematical abstraction which cannot describe real physical processes. However, at least one physical process describable by the Riemann function does exist, viz.: Analysis of an electric circuit with periodically step-changing parameters can be reduced to a diagram shown in the figure, where $U_1(t)$ - periodically changing input voltage, $K(t)$ - periodically changing transfer ratio of the quadripole, and

Card 1/2

ACC NR:  AT7004330
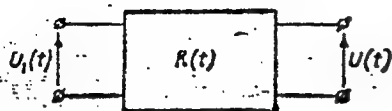


U(t) - sought-for output voltage.  It is proven that the transfer ratio based on average values of the input and output voltages can be expressed in terms of the Riemann function.  It is further proven that, for an interval $0 < x < \infty$, the Riemann function is periodic with a period equal to unity. This function can be physically interpreted as a closed-feedback-loop automatic control system having many stable states; it was used in developing a precision digital millivoltmeter.  Orig. art. has:  3 figures and 4 formulas.

SUB CODE:  09, 12 / SUBM DATE:  14Jul66 / ORIG REF:  001

Card 2/2

PARFENOV, V.V.; SHUMKOV, Yu.V.

Investigation of the magnetic susceptibility of carbon steel in strong magnetic fields. Fiz. met. i metalloved. 1 no.3:434-440 '55.                                                                          (MIRA 9:6)

1.Ural'skiy gosudarstvennyy universitet
                   (Steel--Magnetic properties)

KOVAL'SKIY, V.V.; SHUMKOVA, I.A.

Adaptive changes in the enzymes of the mammary gland in cows. Dokl.
AN SSSR  152  no.5:1243-1246  O  '63.                    (MIRA 16:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zhivotnovodstva.
Predstavleno akademikom A.I.Oparinym.

KOVAL'SKIY, V.V.; SHUMKOVA, I.A.

Adaptive variations in lactic phosphatases and the mammary
glands in cows.  Dokl. AN SSSR 152 no.6:1467-1470 O. '63.
(MIRA 16:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut zhivotnovodstva.
Predstavleno akademikom A.I. Oparinym.

CHERNAVSKIY, V.A.; SHUMKOVA, L.V.

Surgical treatment of diaphyseal fractures of the leg.  Khirurgiia
36 no.6:46-50 Je '60.                            (MIRA 13:12)
                        (LEG—FRACTURES)

SHUMKOVA, M.N.

Growing buckwheat in narrow rows as a means for increasing yields.
Zemledelie 4 no.5:125-127 My '56.                    (MLRA 9:8)

1. Kazanskaya gosselekstantsiya.
                                (Buckwheat)

SHUMKOVA, M.N.; BLAGORAZUMOV, P.N., red.; NABIULLINA, R.S., tekhn. red.

[How to obtain high yields of cereal crops] Kak poluchit' vysokii urozhai krupianykh kul'tur. Kazan', Tatarskoe knizhnoe izd-vo, 1959. 71 p. (MIRA 14:9)

(Grain)

SHUMKOVA, N.

An unusual case of eye injury in a child. Khirurgiia, Sofia 12
no.11:1018-1019 '59.

1. Iz katedrata po ochni bolesti - ISUL.
            (EYE wds.& inj.)

SHUMKOVA, N.

On the transposition of eyeglasses in astigmatism. Khirurgiia, Sofia
14 no.4:429-437 '61.

1. Institut za spetsializatsiia i usuvurshenstvuvane na lekarite,
Katedra po ochni bolesti, Sofiia;   Zavezhdasht katedrata prof.
G. IAnkov.

(ASTIGMATISM)    (EYEGLASSES)

SHUMKOVA, N.

On some problems of medical work expertise in eye diseases.
Khirurgiia 15 no.4:401-408   '62.

1. Institut za spetsializatsiia i usuvurshenstvuvane na lekarite -
Sofiia Katedra po ochni bolesti Zav. katedrata: prof. Iv. Vasilev.
            (DISABILITY EVALUATION)   (OPHTHALMOLOGY)

BULGARIA

N. SHUMKOVA, Department of Ophthalmology (Katedra po ochni bolesti)
Head (rukovoditel) Prof Iv. VASILEV, Institute for Specialization
and Graduate Training of Physicians (ISUL [Institut po spetsializatsiya
i usuvurshenstvuvane na lekarite])[Sofia]

"Exaggerations and Simulations of Eye Complaints by Patients Referred
for Expert Examinations in Connection with Occupational Disability
Claims."

Abstract [English summary modified]: Of 694 workers who had sustained
various types of eye injuries and were applying for disability benefits
or continuation thereof, examination revealed that no less than 602
either exaggerated the degree of their loss of vision, or outright
simulated it (311 exaggerators and 233 simulators.)  These data are
reviewed from various aspects and discussed.  Twelve brief case reports.

1/1

SHUMKOVA, R. D.

Comparative evaluation of different methods of administering aminokrovin in treating hypotrophy in children. Pediatriia no.4: 12-14 '62.                                        (MIRA 15:4)

1. Iz kafedry propedevtiki detskikh bolezney (zav. - dotsent T. E. Vogulkina) Sverdlovskogo meditsinskogo instituta (dir. - prof. A. F. Zverev)

     (BLOOD PLASMA SUBSTITUTES)    (DEFICIENCY DISEASES)

SHUMKOVSKIY, V. (Tallin)

A loop coupler. Radio no.11:29  N '62.  (MIRA 15:12)
(Radio)

SHUMLIN, A A.

Brit. Abs.                                              B I -9, Glass; Ceramics, Ref.

Mechanical strength of an unfired magnesite brick half-finished. A.A. Shumlin (Ogneupory, 1948, 13, 349; Brit. ceram Abstr., 1949. 232 A).- A study was made of the relation between the amount of

hydration of unfired magnesite bricks and their mechanical strength. The initial water content was 2-8%. A linear relation exists between the crushing strength $(R)$ in kg. per sq. cm. and the water of hydration $(G)$ : $R = 18 + 16.68 \, G$.   After drying to a water content of $<0.1\%$ the relation is no longer linear, but on plotting $(R_0 - R)$ against $(G_0 - G^1)$, a straight line passing through the origin is obtained : $R_0$ is the crushing strength (kg. per sq. cm.) of the brick at zero water of hydration $(G_0)$.                         BRIT. CERAM. RES. ASS. (CI).

SHUILIN, M. F. Engr

"Theoretical and Scientific Experimentation as a Factor in the Training of the Communications Engineer."  Cand Tech Sci, Moscow Electrical Engineering Inst of Communications, 18 Nov 54.  (VM, 9 Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO:  Sum. No. 521, 2 Jun 55

L 29306-66    EWT(l)
ACC NR:  AP6012340                        SOURCE CODE:  UR/0108/66/021/004/0033/0039

AUTHOR:  Shumlyanskiy, I. I. (Active member); Lobodzinskiy, V. A. (Active member)

ORG:  Scientific-Technical Society of Radio Engineering and Electric Communication
im. A. S. Popov (Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi)

TITLE:  Use of amplitude limiters in a frequency-selective system

SOURCE:  Radiotekhnika, v. 21, no. 4, 1966, 33-39

TOPIC TAGS:  filter circuit, receiver selectivity, tuned amplifier, amplitude
modulation

ABSTRACT:  The purpose of the investigation was to determine the optimal conditions
under which an amplitude limiter used in conjunction with simple tuned filters in-
creases the selectivity of a system intended for the separation of frequencies of a
discrete spectrum.  The optimal operating conditions of limiters with fixed and
self bias are established, and the value of the grid leak resistance is established
in a case of self bias.  Operation with class A and class C operation are discussed
and it is shown by analysis that a tuned amplifier operating in class C operation
with self bias approaches the optimal conditions of amplitude limitations.  These
conclusions are borne out by experimental tests on a limiter operating a 6Zh9P tube

Card 1/2                                      UDC:  621.395.664

L 29306-66

ACC NR:    AP6012340

at frequencies 235 and 0.2 kcs at a depth of modulation 0.15.  Orig. art. has:  10 figures and 9 formulas.

SUB CODE:  09/    SUBM DATE:  01Sep65/    ORIG REF:  005

Card 2/2 BK

SHUNLYANSKAYA, N.I.; LE BEV, V.J.; MOLOFEEFIY, N.T.

Prolongation of the filtration cycle of cellulose filter
inserts. From. energ. 19 no.8:31-33  Ag '64.

(MIRA 17:11)

AKSENTOV, Yu.V.; SHUMLYAYEV, V.S.

Determination of tolerances in signal brightness variations ,
signal color, and initial phase. Elektrosv'az' 18 no.5:
29-34   My  '64                              (MIRA  17:8)

KERMAN, E.Ya.; MOLCHADSKIY, T.M., inzh.; SHUMLYANSKAYA, N.T., tekhnik

Determining the hardness of condensates.   Energetik 10 no.7:11 Jl '62.
                                                                (MIRA 15:7)
1.   Zamestitel' nachal'nika khimicheskogo tsekha Odesskoy teploelektro-
tsentrali (for Kerman).
            (Feed water—Testing)

80175
S/111/60/000/04/02/003
B022/B008

6,4800

AUTHORS:      Shumlyanskiy, I. I., Docent, Gusarov, Yu. D., Chief Engineer,
              Ochkalenko, N. A., Engineer

TITLE:        Spurious Radiation in Shortwave Transmitters

PERIODICAL:   Vestnik svyazi, 1960, No. 4, pp. 13 - 15

TEXT:   A short classification is given here of spurious radiations in short-
wave transmitters which are divided into parasitic oscillations, combination
frequencies in the balanced modulator of the exciter, combination frequencies
in the transmitter at the mutual interference of the working frequency with the
two mentioned frequencies, and multiple harmonic frequencies. The methods of
frequency control are discussed, with the methods and systems based on 1) the
parametric or quartz control, 2) the direct interpolation of the frequency
(Fig. 1), and 3) the indirect interpolation of the frequency being explained,
and their mode of operation described. The increase in selectivity of the channel
by using additional circuits, and the increase in filtration of the two genera-
tors as well as the improvement in linearity of the balanced modulator are
mentioned as methods of weakening the combination frequencies, and the increase

Card 1/2

Spurious Radiation in Shortwave Transmitters

80175
S/111/60/000/04/02/003
B022/B008

in selectivity of the channel by limiting the amplitude under overvoltage con-
ditions is finally described as the best method. Various circuit diagrams
(Figs. 6-9) are recommended and described in detail for the purpose mentioned.
Getsman, Engineer, Vidgol'ts, Engineer, L. P. Tsvetova, Engineer, and
A. A. Perederiyenko, Engineer, are mentioned. There are 9 figures.

ASSOCIATION: Odesskiy elektrotekhnicheskiy institut svyazi (Odessa Electro-
technical Institute for Communications) Shumlyanskiy, I. I., Docent,
Odesskiy radiotsentr (Odessa Radio Center) Gusarov, Yu. D., Chief
Engineer, Ochkalenko, N. A., Engineer

Card 2/2

MODEL', Zinoviy Iosifovich; KELLER, O.K., retsenzent; SHUMLYANSKIY, I.I., retsenzent; NOVIKOVA, Ye.S., red.; SHEFER, G.I., tekhn. red.

[Radio transmitters] Radioperedaiushchie ustroistva. Moskva, Gos. izd-vo lit-ry po voprosam sviazi i radio, 1961. 463 p.

(MIRA 14:8)

(Radio—Transmitters and transmission)

RIZKIN, A.A.; SHUMLYANSKIY, I.I.; KHROMYKH, M.K.

Concerning the academic plans of radio engineering departments.
Izv. vys. ucheb. zav.; radiotekh. 4 no.4:504  Jl-Ag  '61.
                                                    (MIRA 14:11)

1. Odesskiy elektrotekhnicheskiy institut svyazi.
                         (Radio)

MURAVKIN, I., inzhener; SHUMLYAYEV, A., inzhener.

Device for determining the best location of a wire ground connection.  Mor.
i rech.flot. 13 no.3:31 Jy '53.                                    (MLRA 6:8)
                        (Electricity on ships)  (Electric currents--Grounding)

SHUMLYAYEV, I.

SHUMLYAYEV, I.

Hub puller. Avt.transp. 32 no.5:39 My '54. (MLRA 7:7)
(Automobiles--Apparatus and supplies)

TSIPERFIN, I.; SHUMLYAYEV, I.

Repairing speedometer cables.  Avt. transp. 33 no.11:33 N '55.
(MLRA 9:3)

(Speedometers)

SHUMLYAYEV, V.A., inzh.

Fastening deadwood pipes by means of welding. Sudostroenie 25
no.12:54-55   D '59.                                (MIRA 13:4)
         (Shipfitting)  (Ships--Welding)

SHUMLYAYEV, V.A., inzh.

      Designing manufacturing and fastening reinforced ring protectors.
      Sudostroenie 26 no. 11:60-61 N '60.      (MIRA 14:1)
          (Shipfitting)      (Cathodic protection)

AKSENTOV, Yu.V.; SHUMLYAYEV, V.S.

Effect of the accuracy of color signal shaping on the quality of the image. Elektrosviaz' 16 no.12:37-42 D '62.     (MIRA 16:1)
(Color television)

SEVERDENKO, V.P., akademik; PASECHNYY, S.A., kand.tekhn.nauk; VITKIN, A.I., kand.tekhn.nauk; SHUMNAYA, V.A., inzh.

Using rough rolls for dressing tin plates.  Mash.Bel.  no.6:44-48 '59.                                              (MIRA 13:6)

1. Akademiya nauk BSSR (for Severdenko).
        (Rolling (Metalwork))

SHUMNAYA, V.A., inzh.; Prinimali uchastiye: MOROZOVA, E.I., nauchnyy sotrudnik; BEREZOVSKIY, V.V., nauchnyy sotrudnik

Pilot plant equipment for the rapid lacquering of black steel strip.  Sbor. trud. TSNIICHM  no.28:212-223  '62.          (MIRA 15:11)
(Lacquer and Lacquering—Equipment and supplies)
(Sheet steel)

ALEKSANDROVA, L.K., inzh.; BEREZOVSKIY, V.V., inzh.; VITKIN, A.I., doktor
tekhn.nauk; KEGELES, A.S., inzh.; SHEYER, E.A., inzh.; SHNOL', R.B.,
inzh.; SHUMNAYA, V.A., inzh.

Coating thin steel strips with plastics.  Sbor. trud. TSNIICHM
no.34:70-81  '63.                                    (MIRA 17:4)

NOVIKOV, V.; MATVEYEV, Yu.M.; FLEHINSKIY, M.B.; BATIST, A.I.; IOSSEL', G.;
    KOROLEV, M.; IVANTSOV, V.; ARONOV, I.; SVETLAKOV, V.; ZAYONCHIK,
    L.Z.; RASPOPOV, I.V.; SERDYUKOV, G.V.; GRISHKOV, A.I.; MAKEYEV, I.F.;
    DELLO, A.A.; SHUMNAYA, V.A., inzh.; SPIRYAGIN, L.P., inzh.; GRISHKOV,
    A.I.; KARDONOV, B.A.; BURDIN, V.M., kand. tekhn. nauk; MOLGACHEV,
    D.A., inzh.; MUZALEVSKIY, O.G.; RIVKIN, A.A.; KEYS, N.V.; KOMISSAROV,
    A.I.

    New developments in research. Stal' 25 no.8:842-845  S '65.
                                                (MIRA 18:9)

SHUMNYY, O., tokar'

It is always easier together. Okhr. truda i sots. strakh. 4
no.5:14 My '60.                                          (MIRA 14:5)

1. Predsedatel' komissii okhrany truda tsekha sborki i ispytaniya
avtobusov L'vovskogo avtobusnogo zavoda, g. L'vov.
            (Lvov—Automobile industry—Hygienic aspects)

SHUMNYY,V.K.

Methods for producing and selecting tetranloid forms of corn
by using colchicine. Izv. SO AN SSSR no.t Ser. biol.-med.
nauk no.2:19-23  '64                          (MIRA 18:1)

1. Institut tsitologii i genetiki Sibirskogo otdeleniya
AN SSSR, Novosibirsk.

SHUMNYY, V.K.

Experimentally produced corn tetraploids.  Dokl. AN SSSR
154 no.2:445-448  Ja'64.                        (MIRA 17:2)

1. Institut tsitologii i genetiki Sibirskogo otdeleniya
AN SSSR.  Predstavleno akademikom N.V. TSitsinym.

SHUMOV, A.

Transportation of storage batteries on pans. Avt. transp. 37
no.5:10-11 My  '59.                              (MIRA 12:8)
                (Storage batteries)
                (Transportation, Automotive)

SHUMOV, A.

The primary organization of the scientific technological
society in action. Avt.transp. 38 no.3:56 Mr '60.
(MIRA 13:6)

1. Uchenyy sekretar' Soveta pervichnoy organizatsii Nauchno-
tekhnicheskogo obshchestva Gosudarstvennogo nauchno-issledovatel'-
skogo instituta avtomobil'nogo transporta.
(Transportation, Automotive)

SHUMOV, A.V.,aspirant

Self-loading motortrucks and the efficiency of their use.
Trudy MADI   no.24:128-136   '58.                    (MIRA 11:12)
(Motortrucks)

SHUMOV, A.

> Requirements of state standards are mandatory.  Za bezop.dvizh.
> 5  no.8:1-3  Ag  '62.                                      (MIRA 15:8)
>
> 1. Nachal'nik laboratorii bezopasnosti dvizheniya Nauchno-
> issledovatel'skogo instituta avtomobil'nogo transporta.
>                 (Transportation, Automotive--Standards)

SHUMOV, A., inzh.; FRUMKIN, M.; DMITRIYEV, I.

Traffic organization and safety. Avt. transp. 43 no.2:42-46
F '65.                                    (MIRA 18:6)

KOZHEVNIKOV, N.A.,inzh.; VOYTKOVSKIY, K.F.,kand.tekhn.nauk; ZIL'BERBORD,
    A.F.,gornyy inzh.; SHUMOV, A.I.,gornyy inzh.

"Principles of mining engineering in conditions of permafrost"
by V.P.Bakakin. Reviewed by N.A.Kozhevnikov and others. Gor.
zhur. no.2:78-79 F '59.                          (MIRA 12:2)

1. Severo-Vostochnoye otdeleniye Instituta merzlotovedeniya
AN SSSR, Yakutsk.
            (Mining engineering)  (Frozen ground)
                  (Bakakin, V.P.)

YELISTRATOVA, T.A.; SULEYMANOVA, Kh.R.; SHUMOV, A.S.; BURLAK, M.F.,

    red.

    [Problems for a course in higher mathematics] Sbornik zadach
    po kursu vysshei matematiki. Moskva, Vysshaia shkola.
    No.4. 1964. 204 p.          (MIRA 18:5)

SHUMOV, A.V., inzh.

Operating self-loading motor vehicles.  Trudy MIEI no.17:110-
124 '61.                                    (MIRA 14:11)
        (Transportation, Automotive—Equipment and supplies)

KLINKOVSHTEYN, G.I., kand. tekhn. nauk,; AKSENOV, V.A., inzh.;
      SARKIS'YANTS, E.G., inzh.; SHUMOV, A.V., inzh.;
      MANUSADZHYANTS, Zh.G., inzh.; TROSHINA, M.Ya., inzh.;
      STETSYUK, L.S., inzh.; PARSHIN, M.A., inzh.; KARPINSKAYA,
      I.M., inzh.; FAL'KEVICH, B.S., doktor tekhn. nauk;
      ILARIONOV, V.A., kand. tekhn. nauk; POLTEV, M.K., inzh.;
      KOGAN, E.I., inzh.; CHIGARKO, G.T., inzh.; KONONOVA, V.S.,
      red.

[Traffic safety and safety measures in automotive transporta-
tion] Bezopasnost' dvizheniia i tekhnika bezopasnosti na av-
tomobil'nom transporte.  Moskva, Transport,  1964.  74 p.
                                        (MIRA 18:1)

1. Moscow. Gosudarstvennyy nauchno-issledovatel'skiy institut avto-
mobil'nogo transporta. 2. Moskovskiy avtomekhanicheskiy
institut (for Fal'kevich). 3. Moskovskiy avtomobil'no-
dorozhnyy institut imeni Molotova (for Ilarionov). 4. Vse-
soyuznyy zaochnyy politekhnicheskiy institut (for Poltev).

BATISHCHEV, Ivan Ivanovich; SHUMOV, Aleksandr Vladimirovich; DUBASOV,
        A.A., red.; STRYZHKOVA, N.I., red.; GALAKTIONOVA, Ye.N.,
        tekhn. red.

        [Operation of self-loading motor vehicles]Ekspluatatsiia avto-
        mobilei-samogruzchikov.  Moskva, Avtotransizdat, 1962. 158 p.
                                                      (MIRA 15:9)
                (Motor vehicles)

SHUMOV, I.N., inzh.

Development of specialized manufacture of metal fastenings. Vest.
mashinostr. 42 no.5:77-81 My '62.                    (MIRA 15:5)
                         (Fastenings)

DZHALILOV, D.R.; SHUMOV, I.P.; GORTAYEV, M.i.

Polarographic determination of santonin in the wormwood Artemisia cina. Apt. delo 14 no.1:36-38 Ja-F '65.

(MIRA 18:10)

1. Samarkandskiy sel'skokhozyaystvennyy institut imeni Kuybysheva.

SHUMOV, I. S.
    S. A. POGODIN, Russ, 58,705, Jan 31, 1941

Cu-Be alloys.

S. A. Pogodin, N. Kh. Abrikosov and I. S. Shumov. Russ. 58,705, Jan. 31, 1941.  The high temp. hardness of a Cu alloy contg. 2-2.5% Be is improved by the addn. of about 0.2% of Mg.

USSR/Processes and Equipment for Chemical Industries -        K-2
        Control and Measuring Devices. Automatic Regulation.

Abs Jour   :  Ref Zhur - Khimiya, No 9, 1957, 33322

            primary element which compensates the temperature distor-
            tion of the primary element of the diaphragm. Pressure
            from the system under study is admitted into a bottom
            chamber through a connection tube. The apparatus is sui-
            table for measuring static and dynamic pressure and va-
            cuum. With a relative distortion of the diaphragm not
            exceeding 0.2-025% the apparatus has a rectilinear res-
            ponse. In the experimental studies diaphragms 50 mm in
            diameter were used. Use of a diaphragm of larger diame-
            ter is disadvantageous since on increase of the diameter
            the frequency of the natural oscillations of diaphragms
            decreases. Diaphragms having a thickness from 0.1 to 7
            mm were used to measure pressures from 0.004 to 900
            kg/cm$^2$, respectively.

Card 2/2

SHUMKOV, M.A.

Ecology of the ticks Ixodes persulcatus. Quantity of ticks and
their providers in areas of massive wood cutting in spruce-fir
forests. Med. paraz. i paraz. bol. 34 no.3:274-277  My-Je '65.
                                                   (MIRA 18:7)

1. Rostovskiy nauchno-issledovatel'skiy institut meditsinskoy
parazitologii Ministerstva zdravookhraneniya RSFSR.

Shumov, M. M.

Pneumatic methods for working basic iron with pure oxygen. S. G. Afanas'ev, M. M. Shumov, Z. D. Epshtein, and T. V. Andreev. Stal' 16, 203-12(1950).—In the first expts., Mn and Si were reduced by blowing 15-30-ton charges placed in an 80-ton ladle by means of a vertical water-cooled tuyère located 150-200 mm. above the bath. A matter of 26-77% Si and up to 85% Mn could be eliminated in this manner by using 14.9-38.5 cu.m./ton of iron or $O_2$. Then a 10-ton vessel was built (described) lined with chrome-magnesite brick, in which iron contg. Si 0.17-0.90, Mn 1.3-2.8, P 0.13-0.28, and not more than S 0.085% was blown together with 5.0-7.5% CaO and 0.5-1.2% bauxite. It was turned down for slagging and for building the second slag. Low-FeO content of the slag did not permit a good P elimination, and it was obtained by cutting $O_2$ pressure in the vertical tuyère and adding simultaneously iron ore. Good dephosphorization was obtained by blowing $O_2$ under 3 atm. at 40-5 cu.m./min. for the first 7.5-10 min., then adding 0.40-1.20% ore and 1.2% bauxite and blowing for 4-6 min. at the rate of 20 cu.m./min., holding the tuyère first 500-700 mm. above the metal and then 600-1000 mm. With this practice rail steel with 0.55-0.78% C and 0.04 max. P was readily produced while C was caught on the way down. All blows were slagged and frequently a new slag was built. A tapping hole was provided in the back of the vessel which permitted removal of the metal, retaining slag in the vessel, from which it was dumped in a conventional manner. This practice was checked successfully in another plant having a 15-ton chrome-magnesite-lined converter, in which up to 31 heats could be made in a day.

J. D. Gat

MOZGOVOY, N.I., inzhener; AFANAS'YEV, S.G., inzhener; SHUMOV, M.M., inzhener; EPSHTEYN, Z.D., inzhener; ANDREYEV, T.V., inzhener

Developing an oxygen-using converter process for open-hearth cast iron. Sbor.trud.TSNIICHM no.13:229-299 '56.     (MLRA 9:11)
(Cast iron--Metallurgy)
(Oxygen--Industrial applications)

AFANAS'YEV, S.G., kandidat tekhnicheskikh nauk; SHUMOV, M.M., inzhener;
    EPSHTEYN, Z.D., inzhener; ANDREYEV, T.V., inzhener.

Converter processing of Martin cast iron using pure oxygen. Stal'
16 no.3:203-212  Mr '56.                                    (MIRA 9:7)

1.TSentral'nyy nauchno-issledovatel'skiy institut chernoy metal-
lurgii.
(Bessemer process) (Oxygen)

AUTHORS: Afanas'ev, S. G., Shumov, M.M., Epshtein, Z.D., Andreyev, T.V., Kvitko, M.P. and Gurskiy, G.V. (Ts.NIIChM and Novo-Tul'sk Works).

TITLE: Some preliminary data on the application of the convertor process for the production of steel from Khalil pig iron. (Predvaritel'nye dannye po konverternomu peredelu Khalilovskogo chuguna).

ABSTRACT: As steel made from Khalil pig iron in air blown convertors is characterised by high sulphur, phosphorus and gas contents a duplex melting shop was designed for the Orsk-Khalilovsk Metallurgical Combine. This consisted of 8 open hearth furnaces (185 tons each) and 3 Bessemer convertors (30 tons each). A preliminary treatment in a basic Bessemer convertor produced a semiproduct of the following composition: C 2.0%, Si 0.05%, Mn 0.10%, P 0.3%, S 0.06%, Cr 0.4%, Ni 1.23%. An effective dephosphorisation could not be obtained due to the formation of viscous inactive slags. Therefore, the possibility of obtaining low phosphorus semiproduct as well as low carbon steel by top oxygen blowing was investigated. For the investigation Khalil pig iron (C 3.9-4.2; Mn 0.25-0.50; Si 0.74-1.0; Cr 2.6-3.0; Ni 0.85-1.25; P 0.3-0.35) was melted in a cupola, desulphurised with soda ash (50% reduction in sulphur) and transferred into the convertor (8.14 m$^3$

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Some preliminary data on the application of the
convertor process for the production of steel from
Khalil pig iron. (Cont.)

total capacity) lined with chrome-magnesite and
magnesite chrome bricks. In 1955, 123 heats (72 –
for semiproduct containing not less than 1.3% C and
33 for mild steel) and in 1956, 20 heats (for mild
steel with maximum percentage of residual chromium)
were carried out. The description of equipment
(Figs. 1 and 2) and melting practice is given. The
results obtained indicated that it is possible to obtain
semiproduct containing not more than 0.05% P, up to
1% Cr, 1.3% C and higher, about 0.05% S, 0.15% Mn and
0.85-1.30% Ni. Apparently a semi-product for an
electric furnace (up to 0.5 – 0.6% C, up to 0.05% P
and 0.5-0.6% Cr) can also be obtained. The production
of low alloy steel containing 0.0006 – 0.0008% of
nitrogen and up to 0.4% of residual chromium without
any diluting additions is also possible. There are 7
diagrams, 4 tables and 2 Russian references.

133-8-5/28

AUTHORS: Afanas'yev, S.G., Shumov, M.M., Epshteyn, Z.D., Andryev, T.V., Beda, N.I., Korobov, I.I., Kostenetskiy, O.N., Lifshits, S.I., Rubinskiy, P.S. and Filipov, S.N.

TITLE: Production of steel in top oxygen blown convertors. (Vyplavka konverternoy stali pri produvke kislorodom sverkhu).

PERIODICAL: "Stal'" (Steel), No.8, 1957, pp.693-700 (USSR).

ABSTRACT: After transfer of the Bessemer melting shop to the top oxygen blowing convertor practice, it produced 250 000 tons of steel. Summary of the operation of the melting shop is given in this paper. The melting shop consists of 3 convertors of 16.5 $m^3$ capacity, with a hydraulic tilting mechanism (Fig.1), with single layer lining from periclase-spinel bricks. Mean service life of the lining is about 150 heats. Lining bricks are ignited to 1680 for 8 hrs. The wear of convertor lining is shown in Fig.2. Water cooled tuyere for oxygen blowing is shown in Fig.3. Waste gas purification system consists of scrubber, ventury scrubber and cyclone (Fig.4). The efficiency of gas cleaning: dust content reduced from 40-50 $g/m^3$ to 0.2 - 0.5 $g/m^3$ (Table 1). The composition of the pig iron supplied from a mixer was as follows: Si 0.5-1.0%, Mn 1.0-1.7%, S 0.04-0.10%, P 0.07-0.11%. As a cooling

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Production of steel in top oxygen blown convertors.(Cont.)

agent iron ore (Fe 49-61% and $SiO_2$ 5.6-13.3%) additions were used.  As fluxes lime (burned in cupolas) and bauxite were used.  The development of melting practice was previously described (Refs.1 and 2).  The production of mild rimming steel is described in some detail. 20.0 to 21.5 tons of pig is transferred into the convertor and depending on the content of silicon 4.5-5.0 of lime, 1.0-1.5% of bauxite and 2.0-3.0% of ore are added before blowing.  The first slag is removed after 5 min. of blowing and a new slag is made by adding 1.5-2.0% of lime and 0.5% of bauxite.  For cooling of the reaction zone 200-300 l of water per heat is added to oxygen. During the first period water is supplied at a rate of 20 l/min (for 3 min), and in the second period 1 min after starting blowing for 5-6 min.  Oxygen consumption is 55-58 $m^3$/min (in the individual periods up to 70 $m^3$/min). The distance between the tuyere and the surface of metal is 800-1200 mm depending on the melting period. The dependence of silicon content in final slags on time of slag removal for the duration of the first period (10 and 5 min) is shown in Fig.5.  The dependence of the yield of good steel and its phosphorus content on the duration of the

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133-8-5/28

Production of steel in top oxygen blown convertors.(Cont.)

first blowing period are shown in Figs.6 and 7 respective-
ly in the form of frequency curves.  A number of experi-
mental melts with single slag was also carried out with
satisfactory results.  The comparison of nitrogen con-
tent in convertor and open hearth steels (CT.3 kn) in the
form of frequency curves is shown in Fig.8.  The compari-
son of the operating results using additions of ore in
small portions and addition of ore before blowing with
water additions to oxygen for the control of metal tem-
perature during blowing is given.  The monthly output of
the shop increased from 13 450 t in October 1956 to
42 323 in May 1957.  The monthly consumption of materials
per ton of steel is given in Table 2 and the frequency
distribution of melts with different yields in Table 3.
The duration of blowing period varied from 13 to 22 min.
The duration of the whole production cycle should be 32
min. but in actual fact it lasted longer due to longer
blowing times and organisational stoppages.  It is con-
cluded that as a result of the introduction of the prac-
tice of blowing basic pig iron with technically pure
Card 3/4    oxygen from the top in basic convertors, mild rimming steel
is produced little different in properties from the

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Production of steel in top oxygen blown convertors.(Cont.)

corresponding open hearth steel.  The control of the process is not complicated and the production of steel of a required composition is not difficult.  The service life of convertors can be increased to 200 heats by increasing their specific volume, improvement in the quality of lining and further improvement in the technology of blow-ing.  With increased capacity of convertors the duration of heats can be decreased by increasing the blowing rate. The yield of steel can be increased up to 87-88%.

There are 3 tables, 8 figures and 2 references, both Slavic.

ASSOCIATION: TsNIIChM and Im. Petrovskiy Works (TsNIIChM i Zavod Im. Petrovskogo).

AVAILABLE: Library of Congress

Card 4/4

AUTHOR:      Shumov, M.M.

TITLE:       Converter Steelmaking of Orsk-Khalilovo Pig Iron With Oxygen
             (Konverternyy peredel orsko-khalilovskogo chuguna s primene-
             niyem kisloroda)

PERIODICAL:  Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1957, Vol 18,
             pp 710-718

ABSTRACT:    A study is made by TsNIICherMet at the "Novo Tul'skiy"
             (New Tula) Metallurgical Plant in a converter of 8.14 $m^3$ vol-
             ume lined with ordinary and chemically-bonded magnesite
             chrome brick. $O_2$ is delivered from above through a water-
             cooled lance of seamless tube. The consumption of water to
             cool a lance with an external diameter of 108 mm is 10 liter/
             sec, the water pressure was 6-8 atm. The mean unit volume
             of converter fluctuates between 0.9 and 1.2 $m^3$/t batch. The
             [Si] in the pig iron fluctuated in the range of 0.56 to 1.3%. The
             [S], ranging up to 0.16%, was reduced by 50% by soda in an
             intermediate ladle. The CaO was delivered in 2 parts: 50%
Card 1/3     before the pig iron was poured into the converter, and 50%

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Converter Steelmaking of Orsk-Khalilovo Pig Iron With Oxygen

after the first slag had been skimmed. The heats were cooled with ore and scrap. The oxygen blow was controlled in accordance with the design of the lance employed. The $O_2$ consumption was 40-45 $m^3$/min, with the tip of the lance at a distance of 800-900 mm from the surface of the bath when at rest. When the object is to obtain an intermediate product, the slag emerges thick, inactive, and with lumps consisting of pieces of undissolved CaO and entrained metal. The formation of such a slag is facilitated by low (FeO) and high ($Cr_2O_3$) (up to 22%). These lumps often remain until the end of the blow (0.04-0.05%). The difficulty of conversion is also manifested in poor P combustion. The end of the blow is determined by attainment of ~1% [Cr], which is found by spectrograph. When the intermediate slag is skimmed, [P] is reduced to $\leq$0.05%. Indices of intermediate-product production are adduced. The yield of satisfactory product is 85-86%. In the production of low-alloy steel grades 10KhGN, 14KhGN, 10KhG2N, 14KhG2N, 14KhGSN, and 10KhG2SN appx 85% meet analysis standards, when checked for Mn and Si. 93% meet analysis standards for C, S, P, and Cr. After the first slag has been taken off, the blow proceeds at the maximum C-oxidation rate. The blow is continued until the flame drops in the converter, and an afterblow is run for 1-2 min. [C] is increased to 0.18% by means of a deoxidizer. The total CaO consumption is 10-12% when it is added in 2 portions. The yield
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· Converter Steelmaking of Orsk-Khalilovo Pig Iron With Oxygen

of good product is ~83% (excluding Fe ore).  The lining has a maximum life
of 58 heats.  The mechanical properties of the sheets obtained satisfy the
requirements of the Technical Specifications.  Technical and economic cal-
culations show that the most profitable way of producing steel is by the
direct converter process alone.

S.L.

1. Blast furnaces--Operation   2. Steel--Production   3. Refractory materials
4. Oxygen--Applications   5. Oxides--Consumption

Card 3/3

AFANAS'YEV, S.G.; KOSTENETSKIY, O.N.; SHUMOV, M.M.; IVANOV, Ye.V.; PAVLOV,
A.I.; GARGER, K.S.; KRIVULYA, G.D.; UMNOV, V.D.; UL'YANOV, D.P.;
MAMCHITS, K.A.; PETROV, S.A.; SOROKIN, A.A.; FRIDMAN, Ye.L.;
EPSHTEYN, Z.D.; IVANTSOV, G.P.; NETESIN, A.Ye.

Reports (brief annotations). Biul. TSNIICHM no.18/19:106-107 '57.
(MIRA 11:4)

1. Zavod im. Petrovskogo (for Kostenetskiy). 2. TSentral'nyy
nauchno-issledovatel'skiy institut chernoy metallurgii (for Shumov,
Epshteyn, Ivantsov). 3. Vsesoyuznyy nauchno-issledovatel'skiy
institut ogneuporov (for Ivanov). 4. Stal'proyekt (for Pavlov).
5. Metallurgicheskiy zavod im. Dzerzhinskogo (for Garger, Krivulya,
Umnov, Ul'yanov, Mamchits, Petrov, Sorokin). 6. Dnepropetrovskiy
filial Gipromeza (for Fridman). 7. TSentral'nyy institut informatsii
chernoy metallurgii (for Netesin)
(Bessemer process)

SHUMOV, M M

VARNAVSKIY, I.N.; MIKHAYLIKOV, S.V., kand. tekhn. nauk, starshiy nauchnyy
sotrudnik; BAPTIZMANSKIY, V.I., kand. tekhn. nauk, dots.; LEVIN,
S.L., prof., doktor tekhn. nauk.; OYKS, G.N., prof., doktor tekhn.
nauk; GERBER, M.S.; BIGEYEV, A.M., kand. tekh. nauk. dots.; LIFSHITS,
S.I., kand. tekhn. nauk; POLYAKOV, A.Yu., kand. tekhn. nauk, starshiy
nauchnyy sotrudnik; FOFANOV, A.A., kand. tekhn. nauk, starshiy nauch-
nyy sotrudnik; OGRYZKIN, Ye.M.; GONCHARENKO, N.I., kand. tekhn. nauk;
ABRAMOV, B.A., nauchnyy sotrudnik; MALINOVSKIY, V.G.; LAPOTYSHKIN,
N.M., kand. tekhn. nauk; AFANAS'YEV, S.G., kand. tekhn. nauk;
SHUMOV, M.M., starshiy nauchnyy sotrudnik; IVANOV, Ye.V.; EPSHTEYN,
Z.D., starshiy nauchnyy sotrudnik.

Discussions. Biul. TSNIICHM no.18/19:107-119 '57.     (MIRA 11:4)

1. Nachal'nik konvertnogo tsekha Orsko-Khalilovskogo kombinata (for
Varnavskiy. 2. Institut metallurgii Ural'skogo filiala AN SSSR
(for Mikhaylikov, Abramov). 3. Direktor Ukrainskogo instituta
metallov (for Goncharenko).4. Dnepropetrovskiy metallurgicheskiy
institut (for Baptizmanskiy, Levin). 5. Zaveduyushchiy kafedroy
metallurgii stali Moskovskogo instituta stali (for Oyks). 6. Za-
veduyushchiy laboratoriyey Yenakiyevskogo metallurgicheskogo
tekhnikuma (for Gerber). 7. Kafedra metallurgii stali Magnitogor-
skogo gorno-metallurgicheskogo instituta (for Bigeyev). 8. Ruko-
boditel' konverternoy gruppy TSentral'noy zavodskoy laboratorii
zavoda im. Petrovskogo (for Lifshits). 9. Institut metallurgii
im. Baykova AN SSSR (for Polyakov).

(Continued on next card)

VARNAVSKIY, I.N.---(continued)  Card 2.
10. Ural'skiy institut metallov (for Fofanov). 11. Institut chernoy
metallurgii AN USSR (for Ogryzkin). 12. Nachal'nik TSentral'noy
zavodskoy laboratorii Yenakiyevskogo metallurgicheskogo zavoda
(for Malinovskiy). 13. TSentral'nyy nacuhno-issledovatel'skiy
institut chernoy metallurgii (for Lapotyshkin, Shumov, Epshteyn).
14. Nachal'nik konverternoy laboratorii TSentral'nogo nauchno-
issledovatel'skogo instituta chernoy metallurgii (for Afanas'yev).
15. Nachal'nik laboratorii Vsesoyuznogo nauchno-issledovatel'skogo
instituta ogneuporov (for Ivanov).
                          (Bessemer process)

LAPOTYSHKIN, N.M., kand.tekhn.nauk; SHUMOV, M.M., inzh.; EPSHTEYN, Z.D., inzh.

Smelting electrical steel in converters with top oxygen blow and its continuous pouring. Biul. TSNIICHM no.23:17-21 '57.
(MIRA 11:2)

(Bessemer process)

133-58-5-8/31

·AUTHORS:    Afanas'yev, S. G., Candidate of Technical Science and
            Shumov, M. M., Engineer

TITLE:      On the Gas Saturation of Convertor Steel Smelted with
            Oxygenated Blast  (O gazonasyshchennosti konverternoy stali,
            vyplavlennoy na kislorodnom dut'ye)

PERIODICAL: Stal', 1958, Nr 5, pp 405-410 (USSR)

ABSTRACT:   The degree of saturation with nitrogen and oxygen of
            convertor steel produced with oxygen enriched blast was
            investigated.  The experimental results are shown in the
            form of graphs and tables in the text.  The dependence of
            nitrogen content in convertor steel on the duration of
            blow (with 40 to 50% oxygen enriched blast) - Fig.1.
            Frequency curves of nitrogen content at various smelting
            practices: a - with ore, b - with scrap and v - by a
            duplex process (in acid and basic convertors) - Fig.2;
            the influence of oxygen concentration in blast on
            nitrogen content of steel (duration of process exceeding
            7 min) - Fig.3; the influence of the end of the blow
            (after the removal of carbon) on the saturation of metal
            with nitrogen (with air blast) - Fig.4; changes in the
            chemical composition and temperature of metal in the
            course of blow (rail steel, 40% oxygen enrichment) -Fig.5;

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On the Gas Saturation of Convertor Steel Smelted with
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  frequency curves of the nitrogen content in convertor (a)
and open hearth (b) steel on the Petrouskiy Works – Fig.6;
the dependence of oxygen content of basic Bessemer steel
on the temperature before the removal of slag (A) and on
the concentration of iron in slag at a temperature of
$1650^\circ \pm 5^\circ C$ (B), using air, 30% oxygen enriched and
oxygen (92% $O_2$) blast (a, b and v respectively) – Fig.7;
the equilibrium curve (theoretical) of the dependence of
contents of [C] and [O] for open hearth metal (a) in
comparison with the field of the actual oxygen content in
open hearth bath (b) according to Ref.1, and data
collected by TsNIIChM (v) for convertor metal produced by
top blowing of pure oxygen – Fig.8; the dependence of
oxygen content of metal on its carbon content – Table 1;
the content of oxygen in the convertor bath at various
levels of FeO in the slag (on smelting steel with 0.55 to
0.78% C) – Table 2; the dependence of oxygen content in
low carbon steel on the iron content of slag – Table 3;
the content of oxygen in various steels after deoxidation –
Card 2/3 Table 4.  It is concluded that in order to produce steel

On the Gas Saturation of Convertor Steel Smelted with
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     by top blowing convertor method in quality equivalent to
open hearth steel, the use of pure oxygen is necessary.
When operating with oxygen enriched blast up to 45% and
the use of ore as a cooling agent, it is possible to
obtain steel with the same nitrogen content as in steel
obtained by top blowing of oxygen of up to 96% purity.
The main factor controlling the oxygen content of metal
is carbon.  On smelting low carbon steels an increase in
oxygen content of metal with increasing proportion of
iron oxides in slag (at the same carbon level) is
observed.
There are 4 tables, 8 figures and 5 references, 4 of
which are Soviet, 1 German.

Card 3/3

Shumov, M. M.

КОНВЕРТЕРНОЕ ПРОИЗВОДСТВО СТАЛИ

report submitted for the 5th Physical Chemical
Conference on Steel Production, Moscow-- 30 Jun 1959.

SHUMOV, M M

19(5)                    PHASE I BOOK EXPLOITATION          SOV/2861

Bardin, Ivan Pavlovich, Sergey Gavrilovich Afanas'yev, Mikhail
    Mikhaylovich Shumov, and Zinoviy Davidovich Epshteyn

Primeneniye kisloroda v konverternom proizvodstve stali
    (Use of Oxygen in the Production of Converter Steel) Moscow,
    Metallurgizdat, 1959.  264 p.  Errata slip inserted.  2,500
    copies printed.

Ed.:  A. Ye. Netesin; Ed. of Publishing House:  L. V. Yablonskaya;
    Tech. Ed. : V. V. Mikhaylova.

PURPOSE:  This book is intended for technicians in metallurgical
    plants and planning organizations.

COVERAGE:  The book presents results of investigation and pilot-
    plant testing of the application of oxygen in the converter
    production of steel.  Experience gained outside the Soviet
    Union in the operation of converters with the use of oxygen
    is discussed.  Comparative technical and economic data on
    steelmaking processes are given, and equipment used for the

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Use of Oxygen(Cont.)                                    SOV/2861

converter process with oxygen blast is described.  N. I.
Mozgov, Engineer, and V. V. Kondakov are mentioned for their
contributions in this field.  References follow several of
the chapters.

TABLE OF CONTENTS:

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Use of Oxygen in the Convertor Melting Shop of the „Krivorozhstal'„
Works

120 m/sec) the water is dispersed into a fine mist.  In
the Ventury tube with a throat diameter of 510 mm,
particles of mist with suspended solids coagulate into
comparatively large drops of a slurry which are caught
in the cyclone and passed into the Dorr pond.  No data
on the degree of cleaning of the gas are given.  The
composition of pig iron used varies within the following
limits:  Si, 0.50 - 0.80;  Mn, 1.0 - 1.4;  S, 0.030 - 0.055;
P, 0.09 - 0.11.  The influence of silicon in pig iron on
the content of phosphorus in the finished steel is shown
in Fig 3.  The optimum amount of silicon in pig was
found to be 0.4 to 0.6%.  Desulphurization of metal
deteriorates with decreasing manganese content in the pig
iron.  Pig iron containing 0.055% sulphur should contain
not less than 1.44% of manganese.  The quality of lime
has a considerable influence on the rate of formation and
nature of the slag.  In view of a considerable
proportion of incompletely fired lime (up to 20%) an
addition of bauxite (1.5 to 2%) is used.  Changes in the
composition of metal during blowing are shown in Table 1
and frequency distribution of costs with various levels

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of sulphur and phosphorus content for various types of steel produced in Table 2. Various types of tuyere nozzles for blowing oxygen were tested (Fig 4), the best results were obtained with a cylindrical nozzle of 65 mm diameter with the outlet widening to 75 mm. The optimum rate of blowing oxygen was found to be about 105 m3/min at a distance of 800 to 1000 mm between the nozzle and surface of the metal. Consumption of materials per ton of steel mean weight and duration of a heat are shown in Table 3. The average weight of heat varied from 33 to 42 tons. Individual heats with charges of 70 to 72 tons confirmed the possibility of blowing a large amount of metal with 1 tuyere. At present, Gipromez is planning designs for the transfer of convertor for 53 to 55 ton charges with subsequent bottom pouring of metal into 6 eight ton ingots. It is concluded that some improvements in the productivity can be obtained by operation without the intermediate removal of slag, providing the quality of raw materials is improved. The durability of convertor lining varied

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from 78 to 170 heats.  The quality of steel produced
corresponded to requirements of GOST 380-50 for open
hearth steel (nitrogen content on average 0.006%).  The
actual degree of desulphurization obtained amounted to
50% (of the whole sulphur introduced into the bath with
materials charged).  The construction of 80 to 100 ton
convertors is considered advantageous.  There are
4 figures and 3 tables.

ASSOCIATIONS: TsNIIChM and
        Zavod „Krivorozhstal'„ („Krivorozhstal'„ Works)

Card 4/4

AFANAS'YEV, S.G.; SHUMOV, M.M.; KVITKO, M.P.

Basic regularities in the process of top-blowing of pig iron by
oxygen.   Stal' 20 no.10:884-892 O '60.                (MIRA 13:9)

1. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii.
                    (Bessemer process)